Configure, Verify, and Troubleshoot IPv4 Addresses:

Hands-On Networking Lab Using Cisco Packet Tracer

Ronique Young

2/9/2025

Contents

Introduction

Project Overview:

This project focuses on configuring, verifying, and troubleshooting IPv4 addresses on Cisco routers. The objective is to design and implement a network topology using Cisco routers, configure IPv4 addresses on serial interfaces, and verify the configuration using various show commands.

Project Goals:

- Configure hostnames on Cisco routers
- Configure IPv4 addresses on serial interfaces
- Verify IPv4 address configuration using show commands
- Troubleshoot common issues with IPv4 address configuration

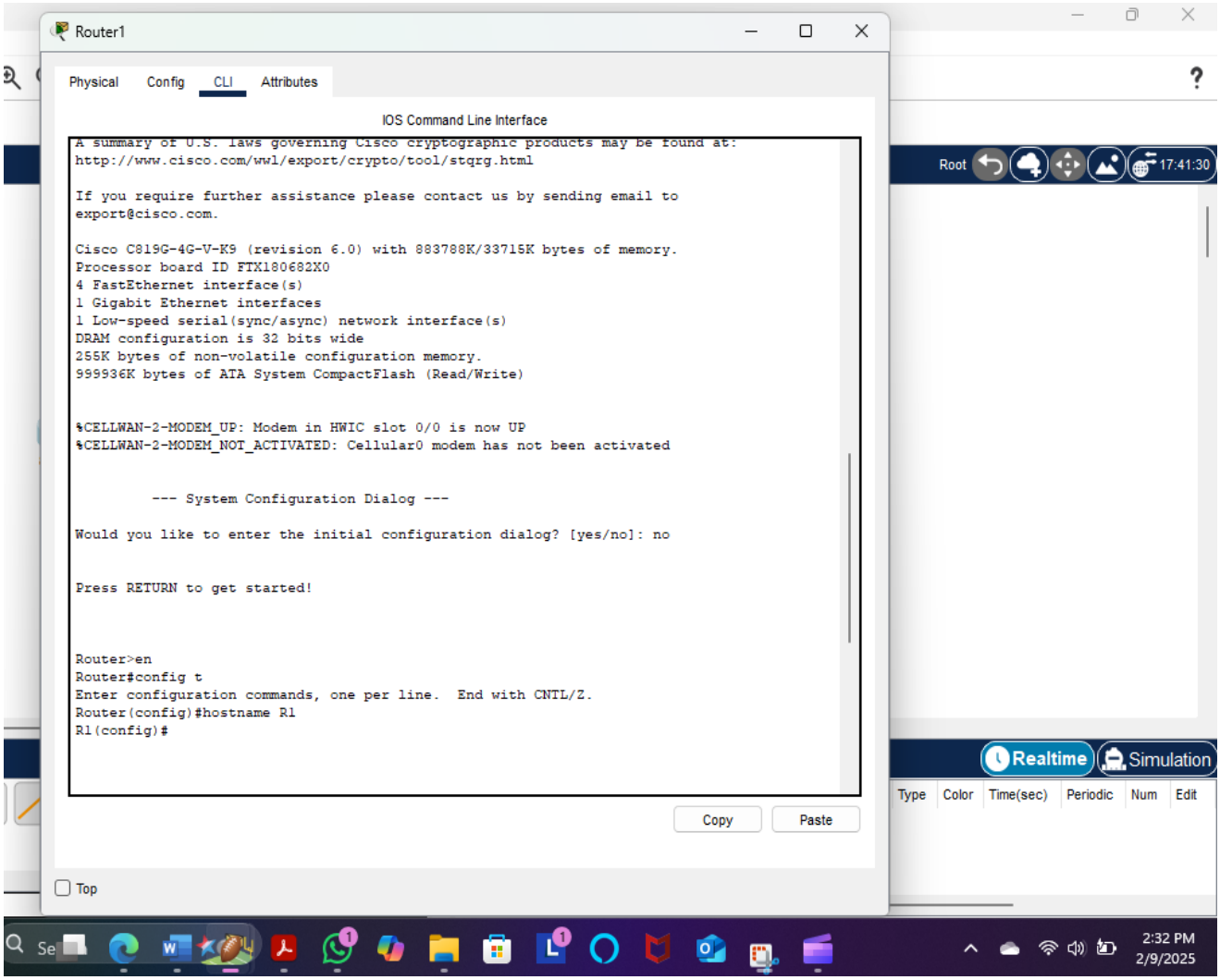
Technologies Used:

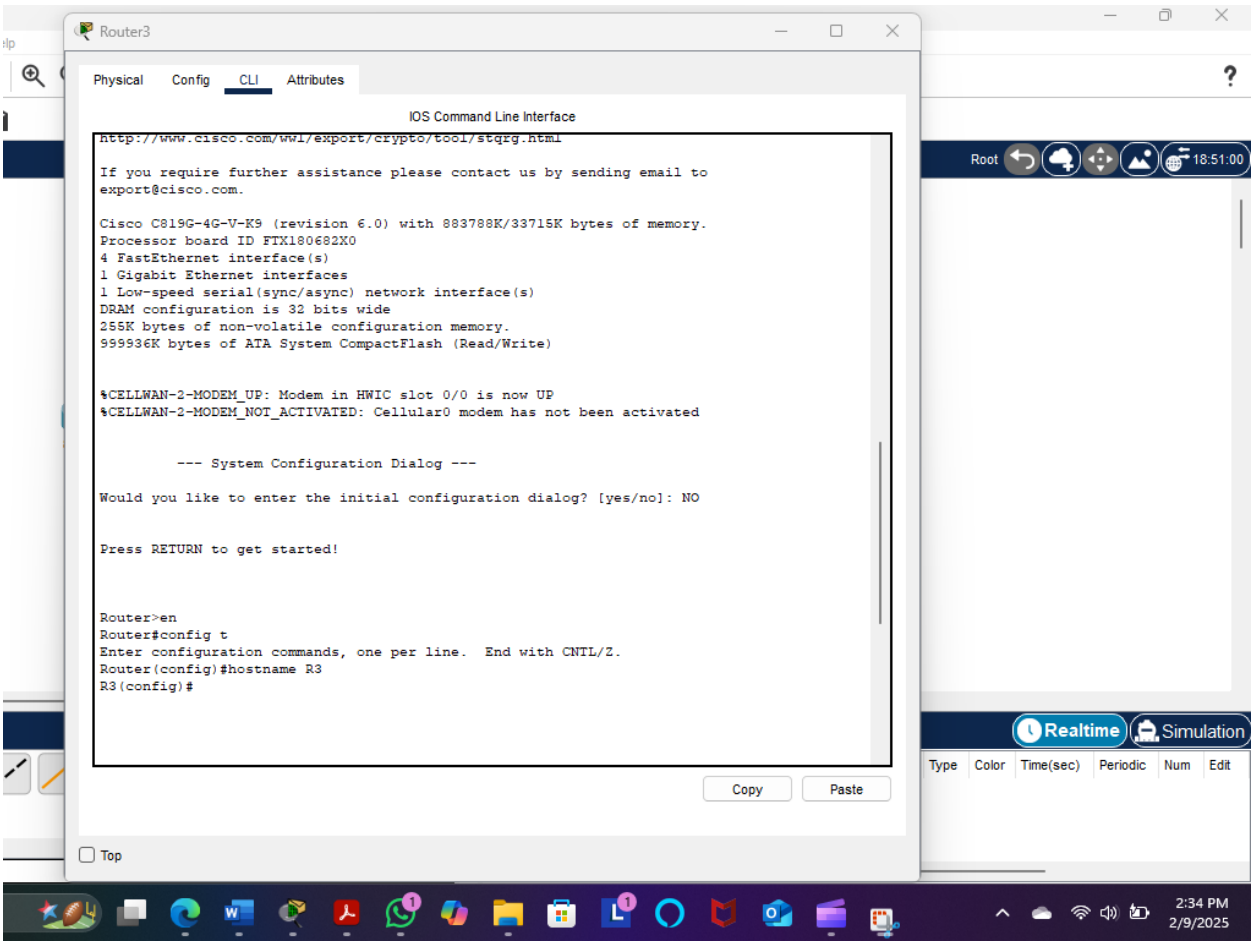
- Cisco routers (819HGW)
- IPv4 addressing
- Serial interfaces
- Cisco IOS commands

Chapter 1: Set up hostnames on routers R1 and R3 using Cisco IOS commands.

The Setup

Screen Shots of Router 1 & Router 2 (Time Stamps in Bottom Right of Picture)




Router3
Physical
Config
CLI
Attributes
IOS Command Line Interface
http://www.cisco.com/wwl/export/crypto/tool/stqrg.html
If you require further assistance please contact us by sending email to
export@cisco.com.
Cisco C819G-4G-V-K9 (revision 6.0) with 883788K/33715K bytes of memory.
Processor board ID FTX180682X0
4 FastEthernet interface(s)
1 Gigabit Ethernet interfaces
1 Low-speed serial(sync/async) network interface(s)
DRAM configuration is 32 bits wide
255K bytes of non-volatile configuration memory.
999936K bytes of ATA System CompactFlash (Read/Write)
%CELLWAN-2-MODEM_UP: Modem in HWIC slot 0/0 is now UP
%CELLWAN-2-MODEM_NOT_ACTIVATED: Cellular0 modem has not been activated
--- System Configuration Dialog ---
Would you like to enter the initial configuration dialog? [yes/no]: NO
Press RETURN to get started!
Router>en
Router#config t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#hostname R3
R3(config)#
Copy
Paste
Top
Root
18:51:00
Realtime
Simulation
Type
Color
Time(sec)
Periodic
Num
Edit
2:34 PM
2/9/2025

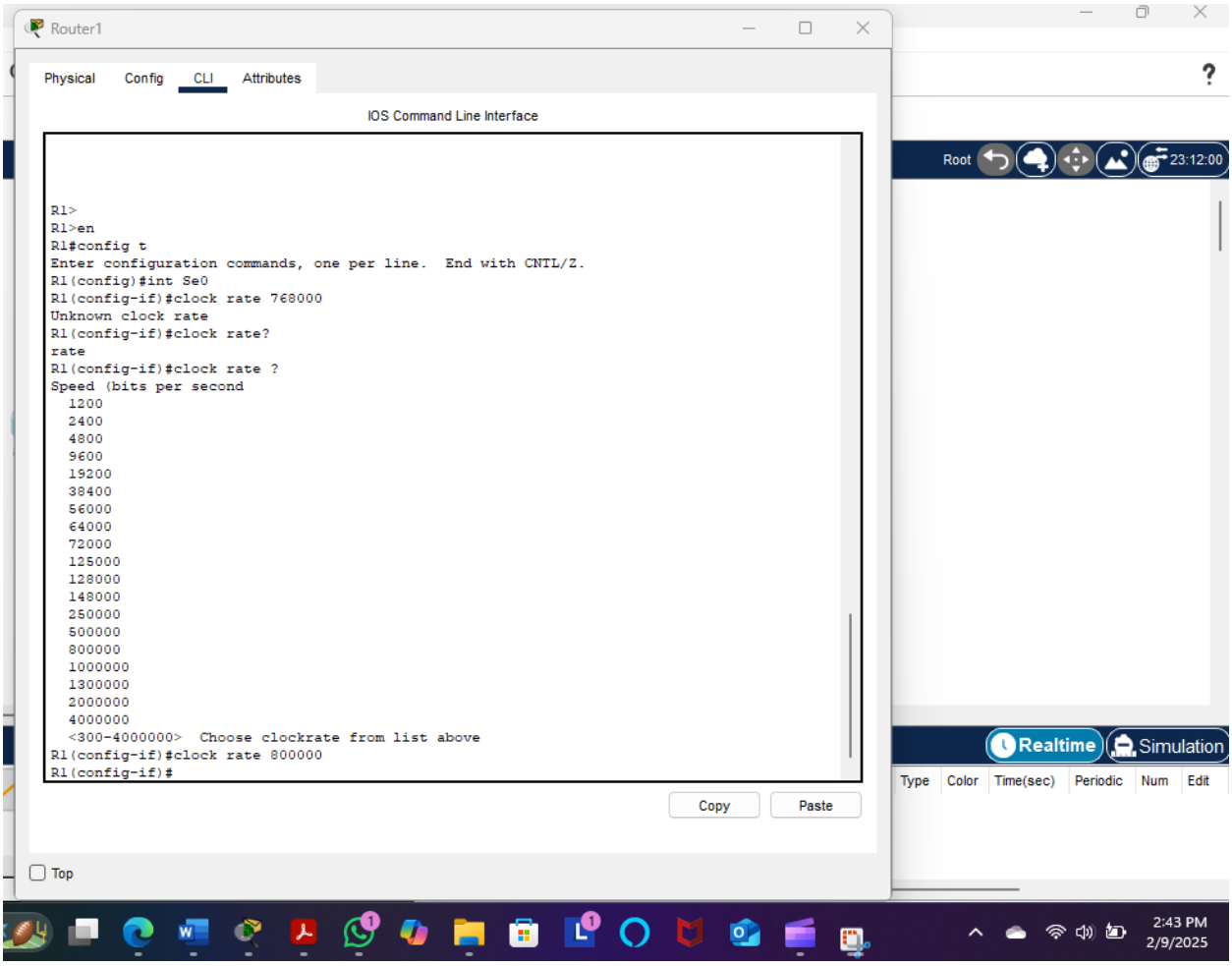
Chapter 2: Configure Serial Interface and Clock Rate

Configure R1 S0/0, which is a DCE, to provide a clock rate of 800 Kbps to R3.

Commands Used in Diagram

R1(config)#interface Se0

R1(config-if)#clock rate 800000



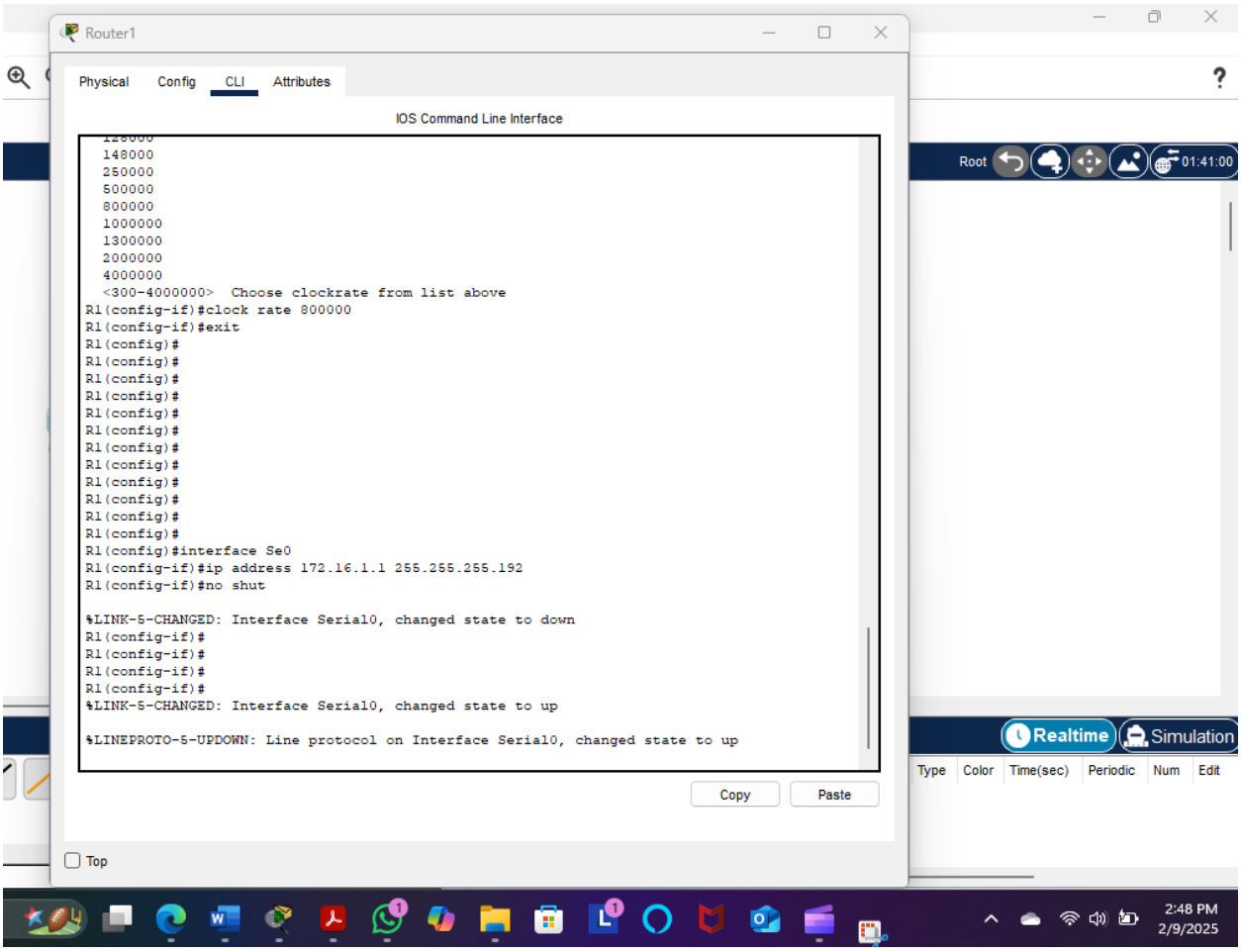
Chapter 3: Configure IP Addresses on Serial Interfaces

Configure the IP addresses on the Serial interfaces of R1 and R3.

Commands Used

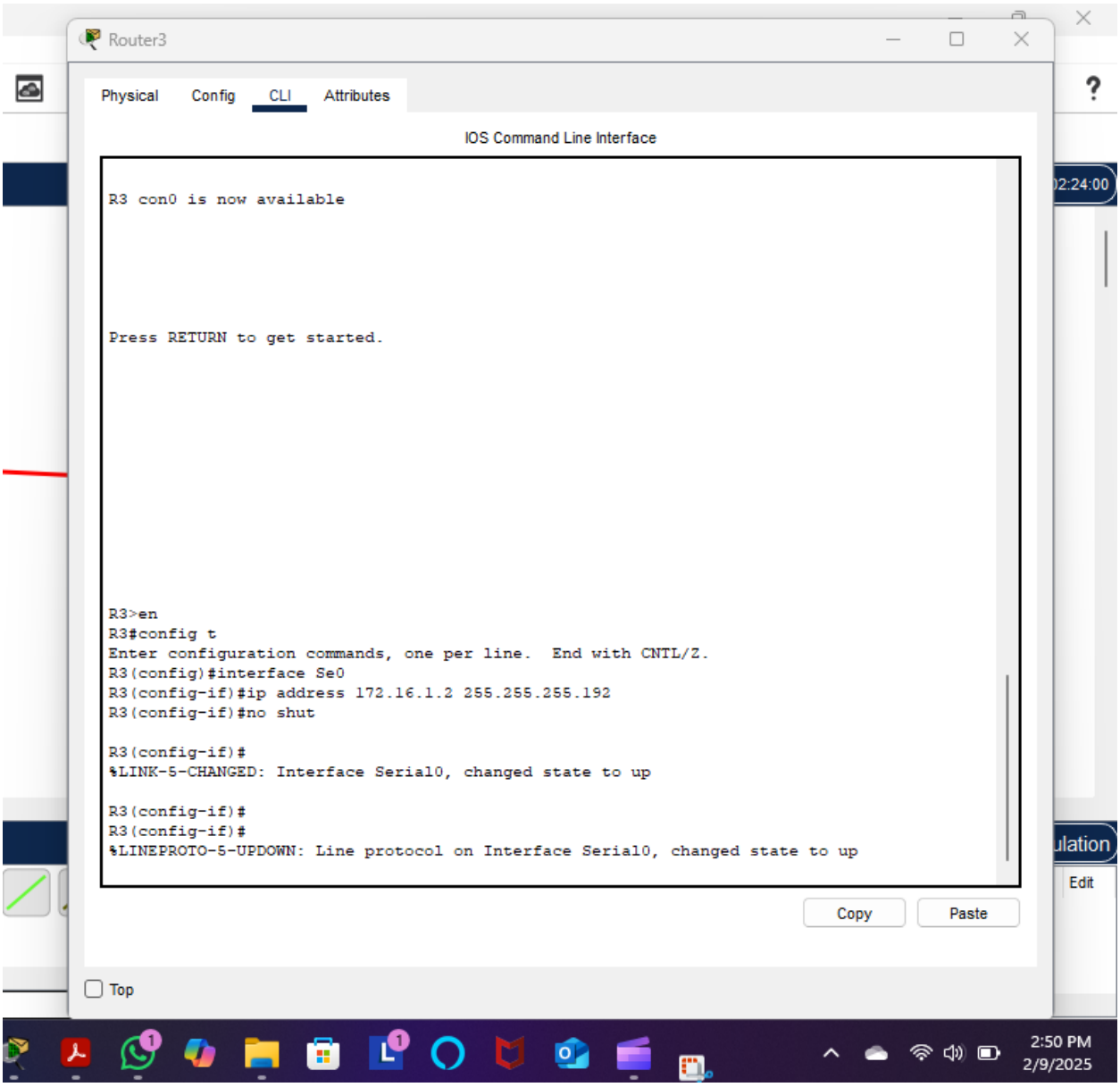
R1(config)#interface Se0

R1(config-if)#ip address 172.16.1.1 255.255.255.192



R3(config)#interface Se0

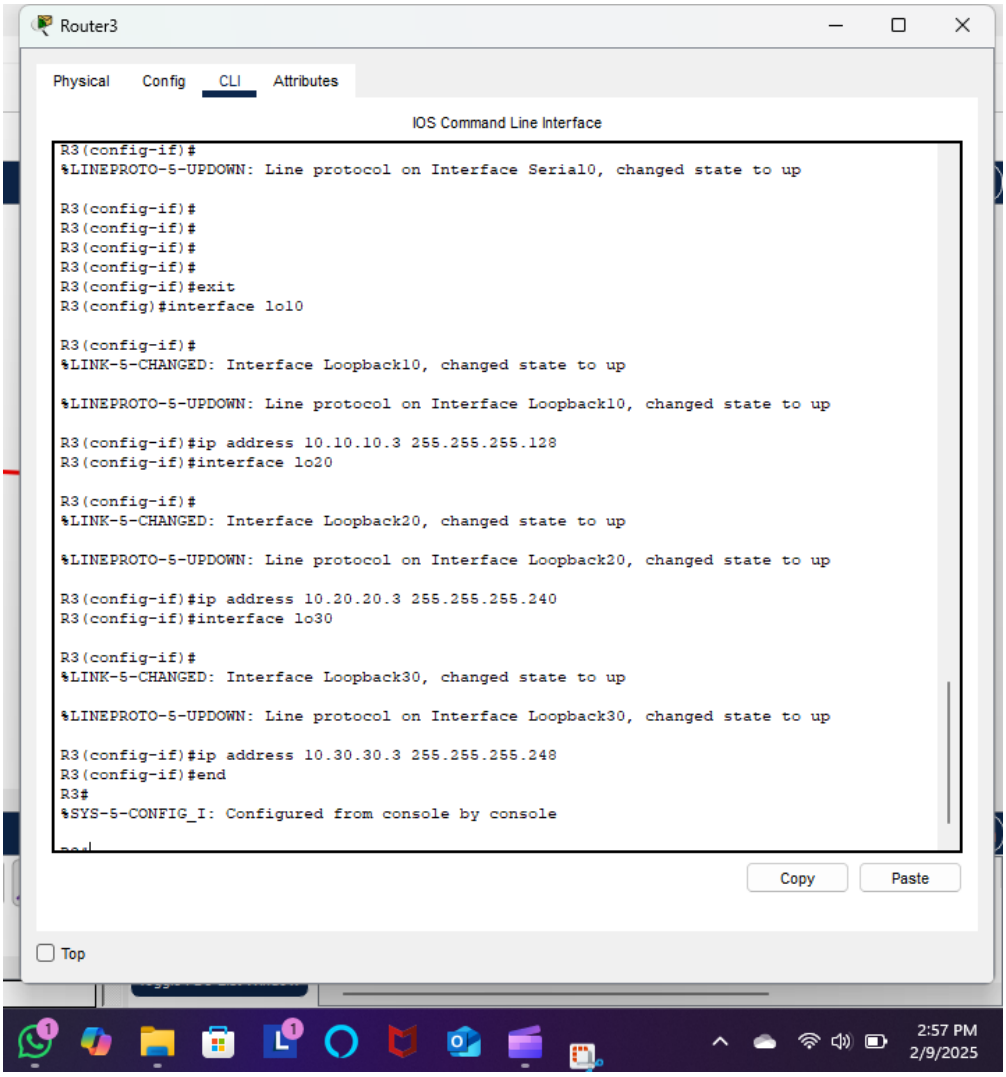
R3(config-if)#ip address 172.16.1.2 255.255.255.192



Chapter 4: Configure Loopback Interfaces

Configure the Loopback interfaces specified in the diagram on R1 and R3.

Commands Used



R3(config)#interface lo10

R3(config-if)#ip address 10.10.10.3 255.255.255.128

R3(config)#interface lo20

R3(config-if)#ip address 10.20.20.3 255.255.255.240

R3(config)#interface lo30

R3(config-if)#ip address 10.30.30.3 255.255.255.248

Chapter 5: Verify IP Address Configuration

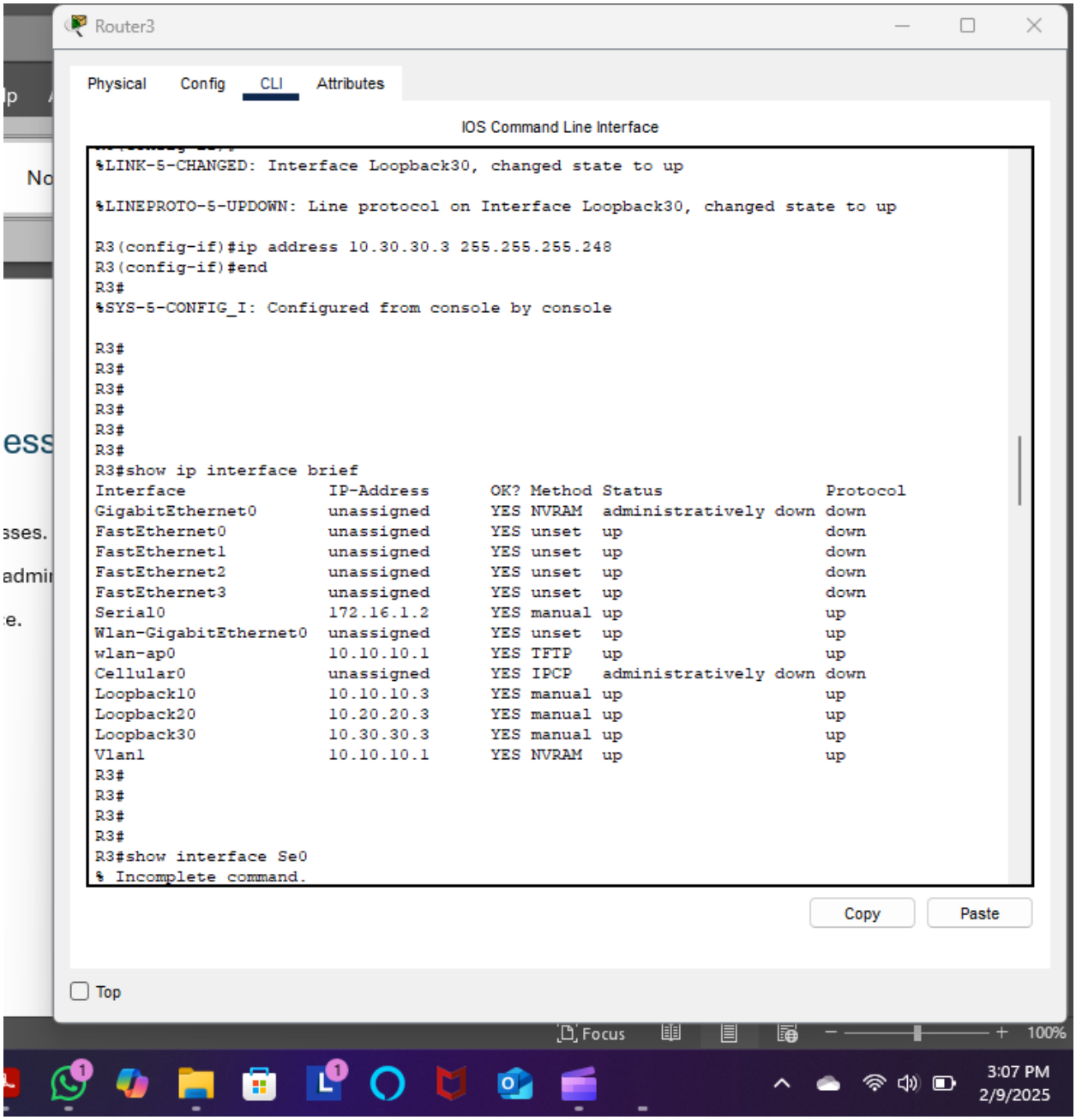
1. The summary of all configured IP addresses.

2. The status of the interface (up/down or administratively down).

3. The subnet mask applied to the interface.

Commands

R3#show ip interface brief



R3#show interface Se0

```
Serial0 is up, line protocol is up (connected)
  Hardware is HD64570
  Internet address is 172.16.1.2/26
  MTU 1500 bytes, BW 128 Kbit, DLY 20000 usec,
     reliability 255/255, txload 1/255, rxload 1/255
  Encapsulation HDLC, loopback not set, keepalive set (10 sec)
  Last input never, output never, output hang never
  Last clearing of "show interface" counters never
  Input queue: 0/75/0 (size/max/drops); Total output drops: 0
  Queueing strategy: weighted fair
  Output queue: 0/1000/64/0 (size/max total/threshold/drops)
     Conversations  0/0/256 (active/max active/max total)
     Reserved Conversations 0/0 (allocated/max allocated)
     Available Bandwidth 96 kilobits/sec
  5 minute input rate 0 bits/sec, 0 packets/sec
  5 minute output rate 0 bits/sec, 0 packets/sec
     0 packets input, 0 bytes, 0 no buffer
     Received 0 broadcasts, 0 runts, 0 giants, 0 throttles
     0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored, 0 abort
     0 packets output, 0 bytes, 0 underruns
     0 output errors, 0 collisions, 1 interface resets
     0 output buffer failures, 0 output buffers swapped out
     0 carrier transitions
     DCD=up  DSR=up  DTR=up  RTS=up  CTS=up
```